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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 09/915,150
Filing Date: July 25, 2001
Appellant(s): DELDUCA ET AL.

MAILED

FEB 07 2008

GROUP 1700

John C. Gatz
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed July 12, 2007 appealing from the Office action mailed February 8, 2007.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The following are the related appeals, interferences, and judicial proceedings known to the examiner, which may be related to, directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal:

This appeal is related to the appeal filed in Application No. 10/190,375. The Notice of Appeal was filed on February 6, 2007 and the corresponding appeal brief was filed on April 6, 2007 and amended brief filed on June 5, 2007 and July 25, 2007.

This appeal is related to the appeal filed in Application No. 09/965,426. The Notice of Appeal was filed on May 23, 2007 and the corresponding appeal brief was filed on July 13, 2007 and amended brief filed on August 31, 2007.

The Examiner is not aware of any other related appeals and interferences.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of the claimed subject matter contained in the brief is substantially correct.

Regarding the independent claims, the appellant's states (page 2 of the appeal brief)

"A retail cut of raw meat (e.g., 26; FIG. 1) is placed within the first package (e.g., 14; FIG. 1) with the meat (e.g., 26, FIG. 1) having meat pigment. The first package (e.g., 14; FIG. 1) is sealed (see, e.g., page 15, line 20)." However, this is not the case for all the independent claims. The independent claim 161 recites "placing a retail cut of raw meat within the first package, the meat having meat pigment; wrapping the first package with a polyolefin or a polyvinyl chloride overwrap".

Although the independent claims 1 and 22 recite sealing the first package, claim 161 recites of **wrapping** and not **sealing** as stated by the appellant.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

6,054,153	Carr et al	4-2000
4,522,835	Woodruff et al.	6-1985
3,459, 117	Koch et al.	8-1969
6,042,859	Shaklai	3-2000
5,711,978	Breen et al.	1-1998
DE 1935566 A	Verbruggen	1-1970

A copy of certified translation of Verbruggen reference (DE 1935566 A) has been provided as a courtesy, however, the rejection still relies only on the abstract.

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Rejection Number 1
Claims 1-6, 8-11,13-26, 28-30, 32-37, 87-90,161,162,164-171 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carr et al. (US 6054153), hereinafter Carr, in view of the combination of Woodruff et al. (US 4522835), hereinafter Woodruff, Koch et al. (US 3459117), hereinafter Koch, and Shaklai (US 6042859).

Regarding claims 1, 22 and 161, Carr teaches a method of manufacturing a modified atmosphere meat package comprising a first package (Figures 1-3, item 14) including a non-barrier portion substantially permeable to oxygen (Column 4, lines 53-54) as instantly claimed.

Carr teaches placing a retail cut of raw meat, including beef, pork, lamb, etc., within the first package (Figures 2 and 5, item 26 and Column 5, lines 19-24). Beef and lamb etc., as taught by Carr contain hemoglobin (red blood pigment) and myoglobin (muscle pigment), thus Carr teaches of meat having meat pigment as instantly claimed.
Carr teaches of wrapping and sealing the first or inner package (column 5, lines 31-42 and Column 1, 60-67). Carr also teaches of supplying a second package substantially impermeable to oxygen (Column 1, lines 50-60) and placing the first or inner package containing meat into the second or outer package, i.e., covering the first package with the second package, without sealing the second package so as to create a pocket (or compartment) between the first and second packages (Figure 2, and Column 1, lines 60-65, Column 2, lines 48-55 and Column 4, lines 43-60).

Regarding claims 1, 22 and 161, Carr further teaches of supplying a mixture of gases into the pocket to form a low oxygen environment so as to form metmyoglobin on a surface of the raw meat (Column 1, lines 10-15). The modified atmosphere taught by

Carr consists essentially of about 30% carbon dioxide or CO_2 and about 70% nitrogen or N_2, in order to reduce the level of oxygen or O_2 in the pocket to preferably 0.05 %, which is 500 ppm or 0.05%, (Column 5, line 60 to Column 6, line 22). Carr also teaches of removing oxygen from the pocket so as to sufficiently reduce an oxygen level therein so as to inhibit or prevent the formation of metmyoglobin on the surface of the raw meat (Column 1, lines 11-15). Carr also teaches of sealing the second package (Column 5, lines 65-67).

Regarding claims 2-4, 23-24 and 162 Carr teaches that flushing alone may not reduce the level of oxygen to less than 0.5%, and teaches of placing an oxygen scavenger and an accelerator in the pocket to reduce the level of oxygen in the pocket to about zero percent in less than 24 hours (Column 5, line 63 to Column 6, line 35).

Regarding claims 5-6 and 25-26, Carr teaches of reducing the oxygen level in the space or pocket between the inner and the outer package. Regarding the level of oxygen, Carr teaches of reducing the level of O_2 in the packet to 0.05 to 5% and preferably to about zero percent in less than 24 hours (Column 5, line 63 to Column 6, line 13). Since 500 ppm is 0.05%, thus Carr teaches of O_2 level of the pocket in the instantly claimed range.

Regarding claims 8-10, 28-30, 164-166, Carr teaches of flushing the pocket or space between the first or inner and the second or outer package with a gas mixture The modified atmosphere taught by Carr consists essentially of about 30% carbon dioxide and about 70% nitrogen, in order to reduce the level of oxygen in the pocket (Column 5, line 60 to Column 6, line 22).

Regarding claims 11 and 30, Carr teaches of the gas mixture consisting essentially of about 30% carbon dioxide and about 70% nitrogen, which falls within the instantly claimed range for the two gases respectively.

Regarding claims 13-15, 32-34, 87-90 and 167-171, Carr teaches removing the second package before retailing, which would modify the atmosphere of the package without

destroying the first package, so that the raw meat is exposed to ambient environment or atmosphere to give the meat the same color as fresh meat (Column 6, lines 42-49).

Regarding claims 16-17 and 35, Carr teaches that the first or inner package is made of a polystyrene foam tray sealed by a permeable polyvinylchloride (PVC) overwrap (Figures 1-3, items 16 and 18, Column 4, lines 60-67).
Note: Also see Abstract, Column 1, line 46 to Column 2, line 45, Column 3, lines 47-67,Column 5, line 60 to Column 6, line 49.

To summarize, Carr teaches of a method of making a modified atmosphere package for meat having meat pigment with first package containing meat and wrapped and sealed oxygen permeable PVC covering, a second package substantially impermeable to oxygen and space between the first and the second package, i.e., pocket. Carr teaches of flushing the space between the first and the second package with a mixture of gases to create a low oxygen environment. Carr also teaches of oxygen scavenger and accelerator to rapidly reduce the oxygen content in the gas mixture within the pocket to prevent the formation of metmyoglobin in meat during the packaging process. Carr further teaches of a gas mixture consisting essentially of about 30% carbon dioxide and about 70% nitrogen, which falls in the instantly claimed range for carbon dioxide and about 70% nitrogen.
However, Carr is silent in teaching 0.1-0.8%, 0.3-0.5% , or 0.1-0.5%, carbon monoxide in addition to the carbon dioxide and nitrogen to form carboxymyoglobin, as recited in claims 1, 11,18-21, 30, 36-37,161 or convert oxymyoglobin directly to carboxymyoglobin as recited in claim 22, wherein the CO is associated with the raw meat within the first package is adapted to be removable such that color of the meat pigment is not fixed and turns brown in a natural time period, upon the removal of the package, as recited in claims 1, 22 and 161.

Woodruff who also is concerned with the color of meat during storage in a low oxygen atmosphere, teaches storing a meat with a gas mixture that contains 10-85% CO_2

(Column 3, line 8), rest substantially N_2, i.e., about 90-15% (Column 3, lines 9-11) and low O_2, 0-30% and as close to 0% as practicable (column 3, lines 12-14 and column 4, lines 1-2), which all fall in the instantly claimed ranges for CO_2, N_2 and O_2 in the meat package. Woodruff teaches of 0.1 to 3% preferably 0.1 to 1% carbon monoxide or CO (Column 2, lines 5-10 and lines 43-44). At this particular level of CO, Woodruff teaches that only the first 0.25 inch of the meat surface undergoes a conversion of deoxymyoglobin to carboxymyoglobin. Woodruff also teaches that the meat is stored in these conditions prior to final sale/consumption packaging (Abstract, Column 1, line 63 to Column 3, line 30, Examples).

Woodruff further teaches the level of CO selected depends on certain factors such as:

(1) The particular type of meat treated, as taught by Woodruff in example VI that pork and lamb require less CO (0.25% and 0.5%) than beef (Column 7, lines 55-59).

(2) The time period between exposure to a non-carbon monoxide/non-oxygen atmosphere prior to exposing the meat to carbon monoxide as explained in examples IV, V and VI where Woodruff teaches that concentrations of CO less than 1% (such as 0.25% and 0.5%) may be effective when sufficient time is allowed after inert gas flushing to convert oxymyoglobin to reduced myoglobin on the surface of meat (Column 6, lines 52-56). In another example Woodruff teaches that CO concentration of 0.25% by volume would be sufficient where oxymyoglobin is converted to reduced myoglobin before conversion of carboxymyoglobin is effected (Column 7, lines 14-17).

Therefore Woodruff teaches that 0.1% to about 1% of carbon monoxide by volume in the modified atmosphere of packaged meat is effective in maintaining the good color in meat during storage.

Koch is also treating red meat with carbon monoxide by providing a cover which when placed in contact with an exposed surface of red meat, releases CO into contact with the meat to form carboxymyoglobin on the surface of the meat (Column 1, lines23-50, Column 2, line 67 to Column 3, line3, Column 3, line 49 to column 4,line 10). Koch teaches that a meat surface that has been exposed to 0.08 cc of CO per square inch area can maintain the red meat color for 7 days during storage under a modified atmosphere with CO, will remain red in color for 3 days after being removed from the

modified atmosphere packaged and packaged in conventional cover or wrapper at the retail outlet (Column 3, lines 4-16 and 41-45), i.e., meat exposed to ambient atmosphere after being exposed to CO will not remain red after 3 days at a retail establishment. Thus, Koch provides evidence that CO is removably associated with a meat surface so that the meat browns "within a natural time period" because the meat generally has a shelf life of 3 days after being removed from the modified atmosphere package and placed in a conventional display wrapper.

Shaklai is relied on as evidence that the color of meat pigment exposed to CO is *not* fixed and that the meat surface will brown upon exposure to air depending on the time the meat is exposed to the CO (Column 8, lines 10-30). In Example 2, Shaklai teaches of meat stores for 30 minutes in CO atmosphere prior to its exposure to air (ambient atmosphere), the meat became brown within 24 hours after exposure to air, which is "within a natural time period" since meat generally may take up to 3 days after exposure to the air or ambient atmosphere to brown. In Example 4, Shaklai also teaches that when meat is preserved in a 100% CO environment for 21 days so that the entire meat becomes red, the outer 1mm eventually becomes brown in 14 days after removing the meat from the CO enriched environment and exposing the meat to air (Example 4 in light of Example 3 in Column 9), i.e., Shaklai even provides evidence that after prolonged exposures to 100% CO the meat pigment is *not fixed* as carboxymyoglobin but is reversibly bound to CO as the meat turns brown due to the formation of metmyoglobin on the surface. Thus Shaklai also teaches that meat pigment or myoglobin, which is bound to CO (bright red carboxymyoglobin), is not fixed and turns brown (metmyoglobin) upon removal from the modified atmosphere and upon exposure to ambient atmosphere or air.

Thus modified atmospheric packages having two compartments have been known in the art for packaging meats containing pigments (Carr). Carbon dioxide and Nitrogen (with or without oxygen) have been known to enhance the shelf life of meats and these gases have been in used in varying proportions in relation to each other (Carr and

Woodruff). Oxygen scavenging packages or labels have also been known in the art of meat packaging to reduce the oxygen level in the modified package (Carr). It has also been known in the art that the addition of carbon monoxide in the range from 0.1-3%, preferably from 0.1-1.0% (Woodruff) to the mixture of gasses consisting essentially of carbon dioxide and nitrogen (about 30% carbon dioxide and 70% nitrogen as taught by Carr) in a modified atmosphere package for meats would form carboxymyoglobin and keep the color of meat fresh and extend the shelf life of pigmented meats until the meat is exposed to atmospheric oxygen (woodruff) by removal of the oxygen impermeable second or outer package. Therefore, it would have been obvious to one of ordinary skill in the art to modify Carr and include anywhere from 0.1-1% carbon monoxide (CO) with other gases in the pocket made by the modified atmosphere package as taught by Carr in view of Woodruff, Koch and Shaklai, to form carboxymyoglobin to maintain the fresh meat color and extend the shelf life of the packaged fresh pigmented meat product. It would have been obvious to modify Carr and include anywhere from 0.1- 1% carbon monoxide, to the modified atmosphere containing nitrogen, and carbon dioxide in the pocket (i.e. between the two packages) to convert the deoxymyoglobin to carboxymyoglobin and convert to oxymyoglobin and then metmyoglobin to brown in a natural time period when exposed to air depending on the particular time in stored in the modified atmosphere, as recited in claims 1,11,18-22,30, 36, 37 and 161, since Woodruff teaches of low/no oxygen modified atmosphere including CO will turn the surface of the meat red in color (i.e. affects the first 0.25 inches of the surface of the meat) at a composition of 0.1- 1% carbon monoxide , 15-90 % nitrogen and 10-85 % carbon dioxide, Koch teaches contacting the surface of a meat in a modified atmosphere with CO to contact the surface of the meat will brown in a natural period (i.e. the red color remains for only 3 days after 7 days of storage) after removal from a modified atmosphere package, and Shaklai teaches the time it takes for a meat surface to brown after removal from storage with CO depends on the time the meat is stored with CO and the concentration of CO. Since Appellant's recited ranges for the amount of CO in the modified packages of about 0.01-0.8% CO (Claims 1, 11, 22 and 30), 0.1-0.5% CO (Claims 21, and 37) and 0.3-0.5% CO (Claims 20, 36 and 161) fall within the

range taught by Woodruff, i.e., 0.1-1% of CO by volume (including 0.25% and 0.5% as indicated in examples I-VI), therefore, it would have been obvious to one of ordinary skill in the art that meat exposed to CO in a similar concentration by volume (Woodruff), packaged similarly (Carr), would have comparable amount of carboxymyoglobin formed on the surface of meat, which would oxidize at about the same rate when exposed to normal atmospheric conditions, i.e., upon opening the package for sale or upon removal of the oxygen impermeable second package. One of skill in the art would have a reasonable expectation of success that fresh meat packaged in a modified atmosphere containing 0.1 to about 1% CO by volume (Woodruff and Carr) would turn brown in a natural time period just as the packaged meat in 0.01-0.8% CO by volume in a modified atmosphere recited by the Appellant.

Rejection Number 2

Claims 1,2, 5-10, 12-15, 18-23, 25-29, 31-34, 36-37, 87-90,161-171 are rejected under 35 U.S.C. 103(a) as being unpatentable over Breen et al. (US 5711978), hereinafter Breen, in view of the combination of Woodruff (US 4522835) and Koch (US 3459117), Shaklai (US 6042859) and Verbruggen (DE 1935566 A).

Note: A copy of certified translation of Verbruggen reference (DE 1935566 A) has been provided as a courtesy, however, the rejection still relies only on the abstract.

Regarding claims 1, 22 and 161, Breen et al., hereinafter Breen, teaches a method of manufacturing a modified atmosphere meat package comprising a first package or over wrapped tray including a non-barrier portion substantially permeable to oxygen (Figure 7, flow diagram and Column 4, lines 17-20) as instantly claimed.

Breen teaches placing a retail cut of fresh raw meat, including red meat, (meat having pigment) within the first package (Column 4, line 64 to Column 5, line 5). Breen teaches of red meat (Column 1, line 36), red meat, such as, beef, lamb etc., contains hemoglobin (red blood pigment) and myoglobin (muscle pigment), thus Breen teaches of meat having meat pigment as instantly claimed.

Breen teaches of overwraping and sealing the first or inner package (Figure 7, Abstract, Column 4, lines 18-21). Breen also teaches of supplying a second package, i.e., outer barrier bag (Figures 5-6, item 26) substantially impermeable to oxygen (Figure 7, Column 1, lines 50-60) and placing the first or inner package containing meat into the second or outer package, i.e., covering the first package with the second package (Column 5, lines 5-10), without sealing the second package so as to create a pocket (i.e., space as shown in figure 6) between the first and second packages. Breen further teaches of evacuating the outer bag and flushing the bag with substantially pure carbon dioxide, i.e., supplying a mixture of gases into the pocket to form a substantially oxygen-free environment so as to reduce or inhibit the formation of metmyoglobin on a surface of the raw meat (Column 1, lines 5-45). The modified atmosphere taught by Breen comprises substantially of pure carbon dioxide (CO_2) in order to reduce the level of oxygen (O_2) in the pocket to preferably 250ppm (Column 5, lines 42-45 and 54). Breen also teaches of removing oxygen from the pocket so as to sufficiently reduce an oxygen level therein so as to inhibit or prevent the formation of metmyoglobin on the surface of the raw meat (Column 1, lines 5-45). Breen also teaches of sealing the second package (Column 5, lines 13-14 and 33-36). Also see Breen (Figure 7, Column 2, lines 27-62, Column 4, lines 40-63, Column 5, line 5 to Column 6, line 5).

Regarding claims 2, 23 and 162 Breen teaches of placing an oxygen scavenger or a desiccant in the outer barrier bag or the second package to reduce the level of oxygen to about 30-50 ppm immediately after sealing, i.e., about zero percent in less than 24 hours (Column 5, line 33-45).

Regarding claims 5-6 and 25-26, Breen teaches of reducing the oxygen level in the space or pocket between the inner and the outer package to 30-50 ppm to 250 ppm within 2-3 minutes of sealing the outer bag (Column 5, line 33-56), i.e., Breen teaches of reducing the oxygen levels to about zero percent in less than 24 hours as instantly claimed.

Regarding claims 7, 27 and 163, Breen teaches of placing the over wrapped trays, i.e., first package, in the oxygen impermeable barrier bag, i.e., the second package, followed by evacuation of normal atmosphere from the outer barrier bag in order to remove the oxygen from the oxygen permeable barrier bag. Thus Breen teaches of evacuating the pocket to remove oxygen as instantly claimed.

Breen teaches of removing oxygen by vacuum, supplying/flushing the bag, as recited in claims 7, 8,27,28,163,164 with substantially pure carbon dioxide gas, as recited in claims 9,10,12,28,29, 31,165,166, and sealing the bag such that oxygen is at 30-50 ppm in the pocket, equilibrating within minutes to 250 ppm and eventually drops off significantly as the meat absorbs the oxygen, as recited in claims 5,6,25,26, which would in turn form oxymyoglobin as recited in claims 18, 22 prevent the formation of metmyoglobin, as recited in claims 1,22, and 161, and due to the lack of oxygen in the package result in the formation of deoxymyoglobin as recited in claims 19 Additionally, Breen teaches at least a portion of bag can be removed for retailing without destroying the tray to expose the meat to ambient atmosphere, as recited in claims 13-15,32-34,87-90,167-171, As an extra measure of safety, Breen further teaches adding an oxygen scavenger in the pocket, as recited in claims 2,23,162 (Figure 7, Column 2, lines 27-62, Column 4, lines 40-63, Column 5, line 5 to Column 6, line 5).

However, Breen is silent in teaching 0.1-0.8%,0.3-0.5% , or 0.1-0.5%, carbon monoxide in addition to the substantially pure carbon dioxide, as recited in claims 1, 12,18-22,31,36,37,161 or convert deoxymyoglobin directly to carboxymyoglobin as recited in claim 1 or oxymyoglobin to carboxymyoglobin as recited in claim 22, wherein the CO is associated with the raw meat within the first package is adapted to be removable, as recited in claims 1, 22, and 161.

Woodruff who also is concerned with the color of meat during storage in a low oxygen atmosphere, teaches storing a meat with a gas mixture that includes carbon monoxide

(0.1-3% CO, along with 20-60% CO_2 , 40-80% N_2 , and 0% O_2) to maintain a desired red color. At this particular level of CO, Woodruff et al. teach only the first 0.25 inch of the meat undergo a conversion of deoxymyoglobin to carboxymyoglobin. Woodruff also teaches the meat is stored in these conditions prior to final sale/consumption packaging. (Abstract, Column 1, line 63 to Column 3, line 30, Examples).

Koch like Breen is concerned with providing a red-colored meat at the retail outlet. Koch et al. teach wrapping a meat with CO containing film under a modified atmosphere, so that the carbon CO is transferred from the film to contact the surface of the meat so that carboxymyoglobin is formed on the meat surface(Column 1, lines 23-50, Column 2, line 67 to Column 3, line3, Column 3, line 49 to column 4,line 10). Koch et al. teach a meat surface that has been exposed to CO for 7 days during storage under a modified atmosphere will remain red in color for 3 days after being removed from the modified atmosphere packaged and packaged in conventional wrapper at the retail outlet (Column 3, lines 4-16). Thus, Koch provides evidence that CO is removably associated with a meat surface so that the meat browns in a natural time period because the meat has a shelf life of 3 days after being removed from the modified atmosphere package and placed in a conventional display wrapper.

Shaklai is relied on as evidence that the color of meat pigment exposed to CO is *not* fixed the meat surface and that the meat surface will brown upon exposure to air depending on the time the meat is exposed to the CO (Column 8, lines 10-30). In Example 2, Shaklai teaches after storage for 30 minutes to CO, the meat became brown within 24 hours after exposure to air , which is "within a natural time period" since meat general may take up to 3 days after exposure to the air to brown.

Verbruggen is relied on as further evidence of the conventionality of utilizing a carbon dioxide and carbon monoxide gas mixture for preserving meat (See Abstract).

Therefore, it would have been obvious to modify Breen et al. and include anywhere from 0.1-0.8% carbon monoxide , 40-80% nitrogen, and 20-60% carbon dioxide in the modified atmosphere pocket (i.e. between the two packages) to convert the deoxymyoglobin to carboxymyoglobin and convert to oxymyoglobin and then metmyoglobin to brown in a natural time period when exposed to air depending on the particular time in stored in the modified atmosphere,, as recited in claims 1,11,18-22,30, 36, 37 and 161, since Woodruff teaches low/no oxygen modified atmosphere including CO will turn the surface of the meat red in color (i.e. affects the first 0.25 in.) at a composition of 0.1-0.8% carbon monoxide , 40-80% nitrogen and 20-60% carbon dioxide, Koch et al. teach contacting the surface of a meat in a modified atmosphere with CO to contact the surface of the meat will brown in a natural period (i.e. the red color remains for only 3 days after 7 days of storage) after removal from a modified atmosphere package, and Shaklai teaches the time it takes for a meat surface to brown after removal from storage with CO depends on the time the meat is stored with CO. One would have been substituting one conventional carbon dioxide/ nitrogen based atmosphere for another for the same purpose: providing a low/no oxygen atmosphere for providing the appearance of fresh cut meat after storage. Forming carboxymyoglobin from deoxymyoglobin or oxymyoglobin would have been obvious depending on the level of oxygen in the modified atmosphere since Breen et al. teach some oxygen may be present during the first 24 hours.

(10) Response to Arguments

Appellant has structured their Arguments (see pages 4-22 of appellant's response) as follows:

I. Present Invention

II. General Law of Obviousness

III. Arguments with respect to independent claims 1, 22, and 161 with respect to rejection no. 1.

IV. Arguments with respect to independent claims 1, 22, and 161 with respect to rejection no. 2
V. Arguments with respect to non-obviousness of independent claims 1, 22 and 161

Sections I and II primarily provide background information and do not present any specific arguments. Therefore, the response to arguments will largely address sections III-V.

Response to Argument I:

On page 5, first paragraph, Appellant talks about "reduction or elimination of the seasoning period" and that the seasoning period can be reduced to one or two days "If a foam tray is not used". It appears that the appellant is relying on the above features but these features are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

On page 5, second paragraph, Appellant states that "One important aspect of the present invention is that the present invention does not "fix" the color of the meat pigment to red with its use of carbon monoxide (CO), but rather the meat pigment tends to turn brown in a natural time period after removal of the second package that is substantially permeable to oxygen". However, as shown in the rejections above, the above said important aspect of the claimed invention is not novel (this is explained in more detail below with reference to arguments III-V).

Appellant further states (page 5, 2nd paragraph, last sentence) that "The term "fix" in this context does not mean that the color of the meat pigment never changes to brown color, but rather that the meat pigment does not turn brown in a natural time period after the meat pigment is exposed to atmosphere". It is noted that a "a natural time period" reference above is variable because it is affected by a number of factors that vary in

nature. For example, geographical location (i.e. a cold place like Alaska vs. a generally hot and humid place like Florida) or a specific season (e.g. winter or summer) can significantly change the natural time period in which meat turns brown or the time required for meat to become unfit for consumption. Other factors such as the size of meat cut (for example, ground meat vs. a single piece) or the type of meat (for example, beef vs. fish) also have an effect. The specification or the claims do not recite any specifics on how (or under what conditions) to determine the natural time period under variable natural conditions. Shaklai reference presents an example where a CO-treated meat sample that has turned red starts to reverse the color change after approximately 24 hours following exposure to air (Col. 8, lines 47-48), which is considered to be a natural time period since meat may generally take 3 or more days to naturally turn brown (allowing for the variability in natural conditions discussed above). Still further, it is noted that the claims do not specify the extent to which meat must "turn brown" and hence any extent of meat turning brown in a natural time period reads on "turns brown in a natural time period".

Response to Argument II:

Appellant argues that that "the Examiner has not set forth a prima facie case of obviousness". This argument is not persuasive and is discussed in response to the more specific arguments detailed in the following sections.

Response to Argument III:

Appellant argues regarding independent claims 1, 22 and 161) that "**It would not have been obvious to combine Carr in view of other references such as Koch, Woodruff, Shaklai and/or Verbruggen to arrive at the present invention**". Appellant appears to arrive at the above conclusion because Appellant believes that the understanding of **those of ordinary skill in the art at the time of the invention was that CO "fixes" the color of the meat pigments and hence there would be "no**

motivation" to one of ordinary skill in the art for using CO in a modified atmosphere such as disclosed in Woodruff, Koch, Shaklai and/or Verbruggen with meat-packaging system such as disclosed by Carr". In other words, Appellant is arguing that it was not known in prior art that removal of modified atmosphere comprising CO will cause the color of the meat pigment on the surface of the meat to turn brown (i.e. change from the bright red carboxymyoglobin color to brown metmyoglobin color).

This is not deemed persuasive for the following reasons:
The prior art of record currently applied in the rejection of the pending claims teaches that when raw meat is exposed to a modified atmosphere comprising CO, meat pigments are associated with CO forming carboxymyoglobin, which turns meat bright red. However, when the CO atmosphere is removed and meat is exposed to air, the dissociation of CO with the meat pigments is initiated and the meat starts to reverse its previously attained carboxymyoglobin red color. Shaklai reference presents an example where a CO-treated meat sample that has turned red starts to reverse the color change after approximately 24 hours following exposure to air (Col. 8, lines 47-48). In other words, it was known in the art at the time of the claimed invention that CO exposure does not fix the color of the meat pigments, and that when exposed to air, the CO imparted color of meat pigments will start to reverse. Therefore, Appellant's assertion that the understanding of those of ordinary skill in the art at the time of the invention was that CO "fixes" the color of the meat pigments", is unsubstantiated.

Note that Carr teaches all the claimed elements of independent claims 1, 22 and 161, except that Carr is silent about the modified atmosphere comprising CO. In fact, comparing Figure 1-3 of Carr to Figure 1-3 of Appellant's specification, it can be seen that the packaging is almost identical. Woodruff is introduced to show that a modified atmosphere for meat packaging, wherein the atmosphere comprises CO (which is the only aspect not taught by Carr for the above mentioned claims), was known. In fact, Woodruff discloses a modified atmosphere comprising CO, wherein CO concentration

may be as low as 0.1 vol % (Col. 2, lines 4-9), which falls in the Appellant's claimed range of "from about 0.01 to about 0.8 vol% carbon monoxide". Carr modified in view of Woodruff thus teaches all the elements of claims 1, 22 and 161. Other references are provided to show that it was known in the art that the association of CO with meat pigment is reversible and hence supports the motivation of combining the references.

Given that the method of manufacturing the modified atmosphere package taught by the combination of above references has the same steps, including the provision of the instantly claimed modified atmosphere and including a concentration of CO vol% that falls in the instantly claimed range, it follows that the raw meat will "turn brown" in the same or comparable time period as the Appellant's claimed invention.

Response to Arguments III A.

Appellant argues that **the problem of "Fixing" color is known to those of ordinary skill in the art citing declarations from various sources**. These declarations do not provide specific arguments that establish why the references provided in the rejection do not teach that association of CO with meat pigments is reversible.

Response to Arguments III B

Appellant alleges (page 10, 2nd paragraph, 1st sentence) that **none of the references of Shaklai, Koch, Woodruff or Hermann teach "the claimed first and second packages"**. In response to Appellants above arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Shaklai, Koch, or Woodruff are not being relied upon to teach "the claimed first and second packages", as the package is taught by Carr.

Under III B(i), appellant alleges (see page 10, 3rd paragraph of Appellant's response) that "**Shaklai teaches that CO "fixes" the color of the meat pigment after exposure to the atmosphere**". This argument is not persuasive. As stated before, Shaklai reference presents an example where a CO-treated meat sample that has turned red starts to reverse the color change after approximately 24 hours following exposure to air (Col. 8, lines 47-48). Clearly, Shaklai is teaching that at least under specific conditions, the CO does not fix the color of the meat pigment after exposure to atmosphere and that the reaction is reversible.

Appellant asserts that **"CO has an affinity 200 times greater than oxygen does with hemoglobin".** Whereas this is true, this does not imply that CO "fixes" the color of the meat pigment. Affinity of one compound towards another is only one of the factors that determines reaction kinetics and cannot by itself predict the outcome of the reaction or that the reaction is irreversible.

Appellant further argues that "There is no expectation in Shaklai that by applying the CO levels disclosed in Woodruff that the meat would brown in a natural time period". This argument is not persuasive. As pointed out earlier under Argument III, the reversibility of a reaction is dependent on various factors, including initial concentration of reactants. It is well known that if the concentration of reactants is lowered, all other factors remaining constant, the rate of forward reaction (in this case, the reaction that imparts red color to meat pigment) is decreased. When conditions are changed so that reverse reaction starts (i.e. modified atmosphere comprising CO is removed), it would be expected that the meat would start to turn brown. Woodruff teaches that the level of CO selected depends on the particular type of meat treated (e.g. pork and lamb require less CO than beef); and (2) the time period between exposure to a non-carbon monoxide/non-oxygen atmosphere prior to exposing the meat to carbon monoxide (Example IV, V and VI). Shaklai teaches the time it takes for a meat surface to brown after removal from storage with CO depends on the extent to which the CO has

permeated the meat; i.e. the extent to which the reaction has taken place. It is well known in the art that for any chemical reaction depends, among other things, on the concentration of the reactants (in this case, the vol. % or concentration of CO in the modified atmosphere for a given size/type of meat). Thus, there is a reasonable expectation in view of Shaklai that by applying the CO levels disclosed in Woodruff, the meat would brown in a natural time period. Further, given that Woodruff reference discusses various concentrations of CO that may be used under various conditions, including the CO concentration of about 0.1 vol% (Col. 2, lines 4-9), which falls in the Appellant's claimed range of "from about 0.01 to about 0.8 vol% carbon monoxide", it follows that the meat would brown in a natural time period that is comparable to what would be seen in the Appellant's claimed invention.

Under III B(ii), appellant **alleges that "Koch does not teach or suggest that the use of CO turns meat pigment brown in a natural time period after removal of its CO-containing film"**. In response to Appellant's above argument against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Koch is not being used in isolation but in conjunction with other references like Carr, Shaklai, and Woodruff. Koch teaches a meat surface that has been exposed to CO for 7 days during storage under a modified atmosphere will remain red in color for 3 days after being removed from the modified atmosphere package and packaged in conventional wrapper at the retail outlet (Column 3, lines 4-16). Thus, Koch provides evidence that CO is removably associated with a meat surface and does fix the color of the meat. Further, Woodruff reference discusses various concentrations of CO that may be used under various conditions, including the a CO concentration of about 0.1 vol % (Col. 2, lines 4-9), which falls in the Appellant's claimed range of "from about 0.01 to about 0.8 vol% carbon monoxide" that the Appellant claims enables meat pigment to turn brown in a natural time period.

Under III B(iii), appellant alleges that "**Woodruff does not teach or suggest that the use of CO turns meat pigment brown in a natural time period**". **Similarly, under III B(iv)**, appellant alleges that "**Verbruggen does not teach or suggest that the use of CO turns meat pigment brown in a natural time period**". Again, in response to Appellants above arguments III B(iii) and III B(iv) against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Woodruff is not being used in isolation but in conjunction with other references like Carr, Shaklai, and Koch. It has already been established that the association of CO with meat pigments is reversible (see response to Argument III). Woodruff reference discusses various concentrations of CO that may be used under various conditions, including the CO concentration of about 0.1 vol % (Col. 2, lines 4-9), which falls in the Appellant's claimed range of "from about 0.01 to about 0.8 vol% carbon monoxide". Therefore, as the meat turns brown in a natural time period in the Appellant's claimed range of CO vol%, it follows that the meat would also turn brown in a natural time period in view of the modified atmosphere as taught by Woodruff. **Note** that Verbruggen is not used in conjunction with Carr (it is used in conjunction with Breen).

Response to Arguments IV A:

Appellant again argues that the problems of "fixing" color are known to those of ordinary skill in the art. This argument has already been addressed in section III.

Response to Arguments IV B:

Appellant again argues the applied references of Skaklai, Koch, Woodruff and Verbruggen do not teach or suggest that the use of CO turns meat pigment brown in a natural time period. This has already been discussed, especially in section III.

Response to Arguments IV B (i) - (iv):

Appellant alleges that Shaklai, Koch, Woodruff or Verbruggen do not teach or suggest that the use of CO turns meat brown in a natural time period. This argument has already been discussed in section III and also how the references are to be view in conjunction with each other and not in isolation.

Response to Arguments V B:

Appellant states that CO has not been allowed to be used with fresh meat in the United States for about 40 years. Appellant then states that "The concern of the FDA is believed to be that CO fixes the fresh meat color to a degree that allows a retailer to sell meat that looks good (a bright red color), but is unsafe and potentially dangerous to consume because it has unacceptable levels of bacteria". In response to Appellant's above argument that the references fail to show certain features of Appellant's invention, it is noted that the features upon which Appellant relies (i.e., CO fixes the fresh meat color to a degree that allows a retailer to sell meat that looks good, but is unsafe and potentially dangerous to consume because it has unacceptable levels of bacteria) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Regarding the **FDA regulation not allowing CO in meat storage,** this is not relevant to the issue of obviousness in this case because Patent law is independent from FDA regulatory law. This issue often is discussed with respect to the determination of pharmaceutical utility (MPEP 2107.01: Section V): "FDA approval, however, is not a prerequisite for finding a compound useful within the meaning of the patent laws." In re Brana, 51 F.3d 1560, 34 USPQ2d 1436 (Fed. Cir. 1995) (citing Scott v. Finney, 34 F.3d 1058, 1063, 32 USPQ2d 1115, 1120 (Fed. Cir.1994)).

Response to Arguments V B:

Appellant then states that "**Once in retail display, the meat's myoglobin begins its natural conversion to metmyoglobin (brown)" (emphasis added)**. Thus, Appellant appears to acknowledge that CO does not fix the color of meat and that the process is reversible (i.e., color of meat pigment is not "fixed") upon the removal of modified atmosphere comprising CO. Further, regarding the **FDA regulation, while CO was not allowed in meat storage the US**, this is not relevant to the issue of obviousness in this case because Patent law is independent from FDA regulatory law. This issue often is discussed with respect to the determination of pharmaceutical utility (MPEP 2107.01: Section V): "FDA approval, however, is not a prerequisite for finding a compound useful within the meaning of the patent laws." In re Brana, 51 F.3d 1560, 34 USPQ2d 1436 (Fed. Cir. 1995) (citing Scott v. Finney, 34 F.3d 1058, 1063, 32 USPQ2d 1115, 1120 (Fed. Cir.1994)). The cited references show that the claimed invention is not patentable.

Response to Arguments V C:

With respect to the present invention meeting a **long-felt need**, establishing long-felt need requires objective evidence that an art recognized problem existed in the art for a long period of time without solution. The relevance of long-felt need and the failure of others to the issue of obviousness depends on several factors. First, the need must have been a persistent one that was recognized by those of ordinary skill in the art. In re Gershon, 372 F.2d 535, 539, 152 USPQ 602, 605 (CCPA 1967). There is no evidence presented that this method is indeed more desirable (with respect to cost, food safety, etc.) than other methods for meat packaging, thereby raising doubts about the long-felt need of this specific method. Further, the comments appear to be addressed towards a system using 0.4 vol. % CO, which does not establish a long-felt need for the invention as claimed, since the claims address a broader range of CO from 0.01 to 0.8 vol. %.

Response to Arguments V D:

With respect to the commercial success, it is not clear if the claimed invention resulted in the commercial success or whether other factors contributed to the success, such as increase advertising/marketing. " In considering evidence of commercial success, care should be taken to determine that the commercial success alleged is directly derived from the invention claimed, in a marketplace where the consumer is free to choose on the basis of objective principles, and that such success is not the result of heavy promotion or advertising, shift in advertising, consumption by purchasers normally tied to Appellant or assignee, or other business events extraneous to the merits of the claimed invention, etc. "(In re Mageli, 470 F.2d 1380, 176 USPQ 305 (CCPA 1973)). On page 24, 4th paragraph, last sentence, of Appellant's response, **Appellant asserts that "factors such as increased advertising/marketing were not the cause of success**" but does not provide specific evidence related to effects of advertising/marketing, only assertions and guesses. Further, Appellant's appears to conclude that increased sales of the claimed invention prove "customer preference" and provide "compelling evidence of non-obviousness". However, this argument is not persuasive because increased sales may be the result of heavy promotion or advertising, shift in advertising, consumption by purchasers normally tied to Appellant or assignee, or other business events extraneous to the merits of the claimed invention. Obviousness. Appellant fails to address all of the above factors and simply focuses on cost concluding that the above statement is "nonsensical".

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Jyoti Chawla

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